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UNITED STATES PATENT APPLICATION

FOR

POWER CONTROL FOR A COMPUTER SYSTEM

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POWER CONTROL FOR A COMPUTER SYSTEM

FIELD

[0001] The present invention pertains to a process of controlling power supplied to a group of computers in a computer system, and to a computer system including a power controller for controlling power provided to the computers of the system.

BACKGROUND

[0002] Many computer systems provide power from a common power supply to the computers of the system. The power supply has a maximum power capacity. If an additional computer is added to the system, that increases the power requirements of the system. If the new power requirements exceed the maximum power capacity of the power supply, the entire system might shut down. Not only is that undesirable, but in critical circumstances it can lead to catastrophic results. While Universal Serial Bus (USB) may protect a single computer when new peripheral components are added, no protection exists for a computer system when another computer is added to the system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The present invention will be described with reference to the accompanying drawings which illustrate preferred embodiments of the invention. In the drawings:

[0004] Figure 1 is a block diagram of a computer system in accordance with a preferred embodiment of the present invention; and

[0005] Figure 2 is a flowchart of a process of controlling power supplied to a group of computers in a computer system in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION

[0006] Figure 1 depicts a computer system 8 in accordance with a preferred embodiment of the present invention. Computer system 8 includes a plurality of computers 10a, 10b, 10c,....10n each of which receives power from a common power supply 12. One of the computers 10a-10n may be a server. A power monitor 14 determines the power available from power supply 12 and monitors the power requirements of the several computers 10a-10n. A power controller 16 controls the power supplied from power supply 12 to the computers 10a-10n based on the power requirements of the individual computers and the available power from supply 12. Power monitor 14 and power controller 16 might be a properly programmed digital processing system, for example. Computer system 10, including computers 10a-10n, power supply 12, power monitor 14, and power controller 16, might be contained within a rack 18, such as a bladed rack, permitting ready addition and removal of computers.

[0007] Figure 2 is a flowchart of a process of controlling power supplied to the computers of a computer system such as computer system 8 in accordance with a preferred embodiment of the present invention. The process begins in step S1. In step S2 power monitor 14 determines the amount of power available from power supply 12. In many computer systems this value is substantially constant and so can be stored within a memory in power controller 16. In step S3, power controller 16 determines whether there has been a new request for power. Such a new request for power might result from an additional computer being added to the group of computers 10a-10n. If there is no new request for power, the process waits in step S3. A new request for power results in a new total power requirement. When a new request for power is detected in step S3, then in step S4, power monitor 14 determines the level of that new total power requirement. In step S5, power controller 16 determines whether the available power as determined in step S2 is sufficient to satisfy the new total power requirement. If so, then the process returns to step S3. If step S5 determines that power supply 12 can not provide sufficient power to satisfy the new power requirement, then in step S6 power controller 16 determines whether the power provided to the computers 10a-10n, including the new computer, can be

reduced, with all of the computers operating at a reduced capacity, for example receiving 75% of their respective usual power requirements. If so, then in step S7, the power is reduced to all of the computers, including providing the additional computer less power than indicated in its request for power. The process then returns to step S3. If step S6 determines that the power to be supplied to all of the computers 10a-10n, including the new computer, can not be reduced, then power controller 16 does not change the level of power supplied to the original computers, but does not allow the new computer to operate, instead providing only standby power to the new computer, for example only 2-3% of its usual power requirement. The process then returns to step S3.

[0008] The present invention thus provides control of power in a computer system, making power readily available to newly added computers when sufficient power is available, while assuring that an existing computer of the system is not made inactive due to a loss of power when an attempt is made to add another computer to the system. Although the present invention has been described with reference to preferred embodiments, various alternations, rearrangements, and substitutions can be made, and still the result will be within the scope of the invention.